

## Claims

- 1           1. A cylindrical encoder, comprising:  
2           a cylinder having a coding surface disposed about a rotational axis, the coding surface  
3           having a series of code lines that spiral about the rotational axis; and  
4           an imaging system sensing movement of the series of code lines when the cylinder rotates  
5           about the rotational axis.
- 1           2. The cylindrical encoder of claim 1 wherein the coding surface is on the outer surface  
2           of the cylinder and the imaging system is external to the cylinder.
- 1           3. The cylindrical encoder of claim 1 wherein the coding surface is on the inner surface  
2           of the cylinder and the imaging system is internal to the cylinder.
- 1           4. The cylindrical encoder of claim 1 wherein the series of code lines includes alternating  
2           optically transmissive bands and optically non-transmissive bands, and wherein the imaging  
3           system includes an optical emitter internal to the cylinder and an optical detector external to the  
4           cylinder.

1           5. The cylindrical encoder of claim 1 wherein the series of code lines includes alternating  
2           optically transmissive bands and optically non-transmissive bands, and wherein the imaging  
3           system includes an optical detector internal to the cylinder and an optical emitter external to the  
4           cylinder.

1           6. The cylindrical encoder of claim 1 wherein the code lines have a predesignated pitch  
2           and are at a predesignated angle relative to the rotational axis providing an effective pitch for the  
3           code lines that is greater than the predesignated pitch.

1           7. The cylindrical encoder of claim 6 wherein the cylindrical encoder has a resolution  
2           that is proportional to the radius of the cylinder and inversely proportional to the effective pitch.

1           8. The cylindrical encoder of claim 7 wherein the coding surface is on the outer surface  
2           of the cylinder and the imaging system is external to the cylinder.

1           9. The cylindrical encoder of claim 7 wherein the coding surface is on the inner surface  
2           of the cylinder and the imaging system is internal to the cylinder.

1           10. The cylindrical encoder of claim 7 wherein the series of code lines includes  
2           alternating optically transmissive bands and optically non-transmissive bands, and wherein the  
3           imaging system includes an optical emitter internal to the cylinder and an optical detector  
4           external to the cylinder.

1           11. The cylindrical encoder of claim 7 wherein the series of code lines includes  
2           alternating optically transmissive bands and optically non-transmissive bands, and wherein the  
3           imaging system includes an optical detector internal to the cylinder and an optical emitter  
4           external to the cylinder.